

temperature, 57, was the same as that noted for 1879. The reports of United States Army post surgeons and voluntary observers show the following maximum temperatures in states and territories where temperature rising to or above 80 was reported: Fort Ringgold, Tex., 97; Volcano Springs, Cal., 96; Alva, Fla., 91; Gila Bend (2), Ariz., 90; Summit, Miss., 89; Wiggins, Ala., 85; Houma, La., 84; Hot Springs, Ark., and Louisville, Ga., 82; and Moab and Saint George, Utah, 80.

The lowest minimum temperature reported by a regular station of the Signal Service was -34, at Fort Assiniboine, Mont., and the temperature was below -30 generally over North Dakota and east Montana. Minimum temperature falling to or below 0 (zero) was reported north of a line traced from east Maine irregularly south of west to central Kansas, thence north of west to east Oregon, and thence northward over east Washington. At stations in the Dakotas, Montana, and north Nebraska, the minimum temperature was 2 to 8 lower than previously reported for March. The minimum temperature was also the lowest on record for March at Springfield, Ill., Olympia, Wash., and Portland, Oregon. The reports of United States Army post surgeons and voluntary observers show the following minimum temperatures in states and territories where minimum temperature falling to or below 0 (zero) was reported: Rhinelander, Wis., -44; Breckenridge, Colo., -41; Pokegama Falls, Minn., -40; Fort Niobrara, Nebr., -38; Fort Keogh, Mont., -37; Wahpeton, N. Dak., -36; Fort Bennett and Oelrichs, S. Dak., and Hayward, Wis., -28; Roscommon, Mich., -27; Henry's Lake, Idaho, -25; Alliance, Nebr., -24; Berlin Falls, N. H., -22; Fort Fetterman and Wheatland, Wyo., -20; Larrabee, Iowa, -19; Constableville, N. Y., and Jacksonville, Vt., -18; Corry and Dyberry, Pa., -14; Fairfield, Me., -13; Heath, Mass., and Monero, N. Mex., -12; Excelsior Springs, Mo., -11; Salineville, Ohio., -10; Pleasant Hill, W. Va., -9; Waterville,

Wash., and Seneca, Kans., -7; New Hartford (1), Conn., and Aurora (1), Ill., -6; Delphi, Ind., -5; and Park City, Utah, -1.

#### ○ LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart IV by a line traced from the South Carolina coast, north of Charleston, westward to the Mississippi River, and thence southwest over southeast Texas. The western limit of freezing weather is shown by a line traced from south-central Arizona northwestward to extreme southwest Oregon.

#### ○ RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature are given in the table of Signal Service data. The greatest monthly ranges of temperature occurred on the northeast slope of the Rocky Mountains, where they exceed 90, whence they decreased eastward to less than 50 in parts of the Lake region, and in east and southeast New England, southeastward to less than 20 in extreme south Florida, and to less than 40 on the immediate Gulf coast, southward to less than 60 over the east part of the southern plateau, southwest to less than 40 on the south Pacific coast, and west to less than 30 at stations on the immediate middle and north Pacific coasts.

#### ○ FROST.

On the 14th frost injured fruits and vegetables at University, Miss., and on the 15th killing frost damaged tender vegetables and plants at Southport, N. C. On the 14th and 15th frost was reported generally in the east Gulf states, and on the 15th in north Florida. Frost was reported in the west Gulf states south of the 30th parallel on the 9th and 13th; in southeast Arizona on the 7th, 8th, and 9th, and in California as far south as Steeles, San Luis Obispo Co., on the 6th and 30th. Compared with the preceding month the southern limit of frost was about the same, except on the Pacific coast, where it was about 2° farther south in February.

### ○ PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for March, 1891, as determined from the reports of nearly 2,000 stations, is exhibited on Chart III. In the table of Signal Service data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The monthly precipitation exceeded 10.00 in extreme west North and South Carolina, the northern half of Georgia, and from central Mississippi eastward over northwestern Alabama and central Tennessee, at Fort Barrancas, Fla., and at stations in California on the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains. The monthly precipitation exceeded 8.00 over the greater part of the country east of the Mississippi and south of the Ohio rivers, in extreme northwest Washington, and on the extreme north California coast. At stations in extreme southeast California and west Arizona no precipitation was recorded, and less than 0.50 fell over a greater part of the southern plateau and southern California, in west Texas, and along the northern border of the country from the Red River of the North to northeast Washington. Less than 1.00 fell in areas in east-central Texas, in adjoining parts of Missouri, Kansas, Indian Territory, and Arkansas, and in areas in the Rocky Mountain and plateau regions.

The monthly precipitation was above the normal except over the extreme northeast part of the country, at Lake Erie stations, from the west Gulf coast west-northwest over California, and from Washington eastward over the northern part of the

country to west Ontario. The greatest departure above the normal precipitation occurred from the lower Mississippi valley to the Atlantic coast between the 30th and 40th parallels, where it exceeded 4.00, in areas, and the excess was more than 2.00 at Portland, Me., and in an area extending from west Kansas to northwest Utah and southwest Wyoming. The greatest departure below the normal precipitation occurred in Nova Scotia, at Eastport, Me., Los Angeles, Cal., Olympia, Wash., Portland, Oregon, and New Orleans, La., where it was more than 2.00, and the deficiency was more than 1.00 along the middle and south Pacific coasts.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: northeast slope of the Rocky Mountains, 270 per cent.; middle-eastern slope of the Rocky Mountains, 253 per cent.; middle plateau, 208 per cent.; Key West, Fla., 166 per cent.; extreme northwest, 171 per cent.; middle Atlantic states, 153 per cent.; Ohio Valley and Tennessee, 146 per cent.; southeast slope of the Rocky Mountains, 140 per cent.; upper lake region, 139 per cent.; south Atlantic states, 138 per cent.; Missouri Valley, 137 per cent.; east Gulf states, 126 per cent.; upper Mississippi valley, 116 per cent.; lower lake region, 107 per cent.; Rio Grande Valley, 102 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: south Pacific coast, 27 per cent.; southern plateau, 43 per cent.; middle Pacific coast, 52 per cent.; northern plateau, 75 per cent.; west Gulf states and north Pacific coast, 90 per cent.; New England, 98 per cent.

At the following-named stations the precipitation for the current month was the heaviest ever reported for March: Baltimore, Md., 7.94, 3.85 above the normal, and 0.35 greater than previously reported for March, noted in 1881; Washington

City, 8.84, 4.64 above the normal, and 1.60 greater than in 1884; Cumberland, Md., 7.47, 4.59 above the normal, and 2.29 greater than in 1890; Birdsneet, Va., 9.10, 4.22 above the normal, and 0.35 greater than in 1884; Charlotte, N. C., 11.13, 6.37 above the normal, and 1.56 greater than in 1880; Statesburgh, S. C., 7.62, 3.81 above the normal, and 1.72 greater than in 1888; Nashville, Tenn., 10.31, 5.09 above the normal, and 0.93 greater than in 1882; Marquette, Mich., 4.45, 2.97 above the normal, and 0.61 greater than in 1881; Duluth, Minn., 3.13, 1.67 above the normal, and 0.08 greater than in 1882; Wellington, Kans., 3.86, 2.55 above the normal, and 0.89 greater than in 1889; North Platte, Nebr., 2.19, 1.57 above the normal, and 0.37 greater than in 1884; Denver, Colo., 3.10, 2.22 above the normal, and 0.74 greater than in 1886; Salt Lake City, Utah, 4.66, 2.74 above the normal, and 0.66 greater than in 1876; Helena, Mont., 1.37, 0.75 above the normal, and 0.05 greater than in 1888. The heaviest precipitation ever reported for March occurred in the middle Ohio valley in 1890, when the excess above the normal was 3.00 to 5.00; in the Sacramento Valley, on the south Pacific coast, and in Arizona in 1884, when the excess was 4.00 to 5.00 in the Sacramento Valley, 5.00 to 9.00 on the south Pacific coast, and 1.00 to 3.00 in Arizona; in the Red River of the North Valley and Minnesota in 1882, when the excess was 1.00 to 2.00; in the lower Rio Grande Valley in 1878, when the excess was 2.00 to 3.00; in the middle and lower Mississippi valleys and Kansas in 1876, when the excess was 3.00 to 6.00; in western New York in 1873, when the excess was 2.00 to 4.00; and on the South Carolina, Georgia, and north Florida coasts in 1872, when the excess was 4.00 to 6.00.

The least precipitation ever reported for March occurred from the south Atlantic coast over the east part of the east Gulf states and over the middle part of the middle and southern plateau regions in 1887, when the deficiency was 3.00 to 5.00 over the east part of the east Gulf states and 1.00 to 2.00 in the middle and southern plateau regions; generally on the Pacific coast and from the lower Missouri valley eastward over the middle Atlantic and south New England states in 1885, when the deficiency was 3.00 to 5.00 on the Pacific coast, and 2.00 to 4.00 from the Missouri Valley eastward; from the middle-eastern slope of the Rocky Mountains over the middle Missouri valley in 1882, when the deficiency was 0.50 to 0.75; and from the west Gulf states northeastward over central Tennessee in 1879, when the deficiency was 2.00 to 4.00.

In 1882, when the precipitation was the heaviest ever reported for March in the Red River of the North Valley and Minnesota it was the least ever reported for that month on the middle-eastern slope of the Rocky Mountains.

The precipitation from January to March, inclusive, averaged about as follows: in the south Atlantic and west Gulf states, at Key West, Fla., in the Rio Grande and upper Mississippi valleys, the Lake region, and on the middle and south Pacific coasts it was about normal. On the middle-eastern slope of the Rocky Mountains more than double the usual amount of precipitation was reported; in the middle Atlantic, east Gulf, and New England states, the Ohio Valley and Tennessee, the extreme northwest, the Missouri Valley, on the northeast and southeast slopes of the Rocky Mountains, and over the middle and southern plateau regions the precipitation was one-fourth to one-half greater than usual. Over the northern plateau and on the north Pacific coast about three-fourths of the usual amount of precipitation was reported.

#### DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for March for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for March, 1891; (4) the departure of the current month from the average; (5) and the extremes for March during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Mar.	(2) Length of record.	(3) Total for Mar., 1891.	(4) Departure from average.	(5) Extremes for Mar.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
<i>Arkansas.</i>		<i>Inches</i>	<i>Years</i>	<i>Inches</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches</i>	
Lead Hill.....	Boone.....	4.07	9	3.00	-1.07	6.78	1890	2.84	1887
<i>California.</i>									
Sacramento.....	Sacramento.....	3.00	41	1.87	-1.13	10.00	1850	0.09	1885
<i>Connecticut.</i>									
Middletown.....	Middlesex.....	4.67	29	5.96	+1.29	9.49	1876	1.12	1874
<i>Florida.</i>									
Merritt's Island.....	Brevard.....	2.63	13	3.42	+0.79	7.92	1878	0.76	1882
<i>Georgia.</i>									
Forsyth.....	Monroe.....	6.93	17	12.49	+5.56	12.87	1875	1.37	1878
<i>Illinois.</i>									
Peoria.....	Peoria.....	2.55	36	2.68	+0.13	5.82	1859	0.24	1885
Riley.....	McHenry.....	2.63	40	1.64	-0.99	7.23	1876	0.29	1885
<i>Indiana.</i>									
Logansport.....	Cass.....	3.14	16	3.94	+0.80	6.89	1861	0.95	1856
Vevay.....	Switzerland.....	3.93	26	7.71	+3.78	7.54	1890	0.85	1889
<i>Iowa.</i>									
Cresco.....	Howard.....	1.78	18	1.68	-0.10	4.55	1888	0.22	1889
Monticello.....	Jones.....	2.50	36	2.55	+0.05	6.54	1877	0.07	1869
Logan.....	Harrison.....	2.12	23	2.33	+0.21	4.50	1876	0.30	1885
<i>Kansas.</i>									
Lawrence.....	Douglas.....	2.23	23	3.04	+0.81	5.47	1888	0.37	1879
Wellington.....	Sumner.....	1.31	12	3.86	+2.55	3.86	1891	0.00	1879
<i>Louisiana.</i>									
Grand Coteau.....	St. Landry.....	5.32	8	0.80	-4.52	10.20	1884	0.80	1891
<i>Maine.</i>									
Orono.....	Penobscot.....	4.31	21	5.20	+0.89	8.20	1876	1.89	1883
<i>Maryland.</i>									
Cumberland.....	Allegany.....	2.88	19	7.47	+4.59	7.47	1891	0.50	1872
<i>Massachusetts.</i>									
Amherst.....	Hampshire.....	3.45	55	3.14	-0.31	7.14	1876	0.89	1858
Newburyport.....	Essex.....	4.23	11	4.51	+0.28	6.94	1890	0.96	1885
Somers.....	Bristol.....	4.98	18	5.53	+0.55	9.01	1890	1.14	1885
<i>Michigan.</i>									
Kalamazoo.....	Kalamazoo.....	2.48	15	2.10	-0.38	7.33	1877	0.42	1883
Thornville.....	Lapeer.....	2.39	14	2.40	+0.01	4.07	1877	0.71	1889
<i>Minnesota.</i>									
Minneapolis.....	Hennepin.....	1.82	25	1.62	-0.20	9.00	1868	0.32	1883
<i>Montana.</i>									
Fort Shaw.....	Lewis & Clarke.....	0.45	20	0.30	-0.15	1.05	1883	0.04	1873
<i>New Hampshire.</i>									
Hanover.....	Grafton.....	2.35	51	2.32	-0.03	5.25	1888	0.25	1866
<i>New Jersey.</i>									
Moorestown.....	Burlington.....	3.58	27	4.80	+1.22	6.09	1890	1.08	1885
South Orange.....	Essex.....	3.86	19	4.81	+0.95	8.20	1888	0.81	1885
<i>New York.</i>									
Coopersburg.....	Otsego.....	2.89	37	2.60	-0.29	5.29	1871	0.55	1885
Palemo.....	Oswego.....	2.84	37	3.80	+0.96	7.00	1859	0.68	1885
<i>North Carolina.</i>									
Lenoir.....	Caldwell.....	4.02	19	8.30	+4.28	10.20	1875	0.50	1879
<i>Ohio.</i>									
N. Lewisburgh.....	Champaign.....	3.18	15	5.35	+2.17	5.90	1888	0.75	1889
Wauseon.....	Fulton.....	2.81	19	4.45	+1.64	6.52	1876	0.62	1885
<i>Oregon.</i>									
Albany.....	Linn.....	4.48	13	3.41	-1.07	11.71	1866	0.81	1885
Eola.....	Polk.....	4.81	22	2.13	-2.68	10.66	1879	0.55	1885
<i>Pennsylvania.</i>									
Dyberry.....	Wayne.....	3.02	24	4.19	+1.17	5.00	1890	1.03	1885
Grampian Hills.....	Clearfield.....	3.96	20	3.97	+0.01	6.89	1875	1.34	1885
Wellshorrough.....	Tioga.....	5.16	11	2.72	-2.44	10.08	1884	0.66	1887
<i>South Carolina.</i>									
Statesburgh.....	Sumter.....	3.81	10	7.62	+3.81	7.62	1891	0.97	1887
<i>Tennessee.</i>									
Austin.....	Wilson.....	5.66	20	11.43	+5.77	12.59	1875	1.93	1861
<i>Texas.</i>									
New Ulm.....	Austin.....	4.71	18	1.47	-3.24	13.13	1883	1.27	1887
<i>Vermont.</i>									
Stratford.....	Orange.....	3.68	18	3.20	-0.48	4.10	1876	1.55	1878
<i>Virginia.</i>									
Birdsneet.....	Northampton.....	4.88	22	9.10	+4.22	9.10	1891	1.70	1873
<i>Washington.</i>									
Fort Townsend.....	Jefferson.....	1.87	15	0.55	-1.32	4.32	1876	0.11	1884
<i>Wisconsin.</i>									
Madison.....	Dane.....	2.63	23	3.64	+1.01	7.00	1869	0.30	1883

#### EXCESSIVE PRECIPITATION.

Monthly precipitation to equal or exceed 10.00 was reported at 12 stations in Tenn.; at 11 stations in Ga.; at 8 stations in Miss.; at 6 stations in N. C. and S. C.; at 4 stations in Ala.; at 3 stations in Cal., and at 1 station in Fla. Among the heavier monthly rainfalls reported are, 15.50, at Kosciusko, Miss., 14.85, at Diamond, Ga., and 14.18, at Belmont, S. C.

In the last 21 years monthly precipitation to equal or exceed 10.00 in March has been reported for 12 years in Ga.; for 11 years in Ala.; for 9 years in Cal. and N. C.; for 8 years in Wash., Oregon, Miss., and Tenn.; for 6 years in Fla.; for 5 years in Ark. and La.; for 4 years in Mass., S. C., and Tex.; for 3 years in Conn., Ill., N. H., and N. Y.; for 2 years in Ind., N. J., Pa., Va., and Wis.; and for one year in Del., Kans., Ky., Md., Nebr., Ohio, R. I., and Utah. Precipitation to exceed 20.00 in March was reported in Oregon in 1873; in Ala. and Tex., in 1875; in Cal. and Wash., in 1879; and in Nebr., in 1882.

Precipitation to equal or exceed 2.50 in 24 hours was reported at 22 stations in Tenn., and on 4 dates, the 6th to 8th and 30th; at 13 stations in Miss., and on 7 dates, the 5th to 8th, 25th, 26th, and 30th; at 9 stations in Ala., and on 8 dates, the 5th to 8th, 11th, 12th, 25th, and 26th; at 9 stations in Ga., and on 9 dates, the 7th to 9th, 11th, 12th, 26th, 27th, 30th, and 31st; at 4 stations in Cal., on the 1st; at 3 stations in Fla., and on 4 dates, the 10th to 12th and 21st; at 3 stations in S. C., and on 3 dates, the 8th, 9th, and 27th; at 2 stations in La., and on 2 dates, the 7th and 8th; at 2 stations in N. C., and on 2 dates, the 7th and 8th; at 1 station in Del., on the 20th-21st; at 1 station in Idaho, on the 27th; at 1 station in Kans., on the 24-25th; at 1 station in Ky., on the 7-8th; and at 1 station in Wash., on the 20th-21st. Among the heavier rainfalls reported for this period are: 6.71, at Vaiden, Miss., 7-8th; 6.47, at Vicksburg, Miss., 7-8th; 6.10, at Winnsborough, La., 7-8th; 5.40, at Diamond, Ga., 7-8th; 5.23, at Sharp, Tenn., 7-8th; 5.00, at Hendersonville, N. C., 7-8th. At Kosciusko, Miss., 12.60 was reported 5-7th.

In the last 21 years precipitation to equal or exceed 2.50 in 24 hours in March has been reported for 16 years in Ala.; for 14 years in Ga.; for 12 years in La. and Tex.; for 11 years in Fla., N. C., and Tenn.; for 8 years in Miss.; for 7 years in Ark., Ill., and Ind.; for 5 years in Conn., Mass., N. Y., and S. C.; for 4 years in Cal. and Wash.; for 3 years in Iowa, Kans., Ky., Md., Ohio, Oregon, and Va.; for 2 years in N. J., Pa., and Vt.; and for one year in Ariz., Colo., the Dakotas, D. C., Mo., R. I., and Utah. Among the heavier 24-hour rainfalls reported during this period are: 12.65 at Okaloosa, La., 9th, 1878; 7.36 at Atlanta, Ga., 29th, 1886; 8.00 at South Fork, Ky., 22d, 1890.

Precipitation to equal or exceed 1.00 in 1 hour was reported at 1 station in Tenn., on the 6th; and at 1 station in Miss., on the 8th. Remarkably heavy rainfall in 1 hour was not reported for March, 1891, and excessive rainfall for 5 and 10 minute periods is given in the table of "Maximum rainfall in one hour or less."

In the last 21 years precipitation to equal or exceed 1.00 in one hour in March has been reported for 7 years in Tex.; for 6 years in Tenn.; for 5 years in Fla.; for 3 years in N. C.; for 2 years in Ga. and La.; and for one year in Ala., Ark., Miss., N. Y., Pa., and Va. Among the heavier rainfalls reported for this period are: 0.30 in 5 minutes, at Saint Louis, Mo., 27th, 1890; 0.25 in 5 minutes, at Jupiter, Fla., 23d, 1890; 0.60 in 10 minutes, at Saint Louis, Mo., 27th, 1890; 1.08 in 15 minutes, at Knoxville, Tenn., 12th, 1878; 2.00 in 15 minutes (estimated), at Greeneville, Tenn., 27th, 1885; 1.75 in 20 minutes, at Howe, Tex., 21st, 1890; 4.10 in 30 minutes, at Biscayne, Fla., 28th, 1874; and 4.00 in 1 hour, at Terrell, Tex., 19th, 1876.

Table of excessive precipitation, March, 1891.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Alabama.</i>						
Cordova	Inches. 10.46	3.31		Inches	h. m.	
Do.		3.38	6			
Florence	11.80	3.90	7, 8			
Jasper	11.62					
Livingston (1)		3.86	7, 8			
Montgomery		2.62	25, 26			
Mount Vernon Barracks		3.33	25, 26			
Selma (1)		3.00	7, 8			
Talladega		2.73	8			
Tuscaloosa		2.78	5, 6			
Tuscumbia (1)	10.03					
Wiggins		3.26	8			
Do.		3.05	11, 12			
<i>California.</i>						
Georgetown	10.00	3.82	1			
Grass Valley		2.59	1			
Iowa Hill		3.02	1			
Placerville (2)		3.15	1			
Towles	10.52					
<i>Delaware.</i>						
Dover		3.29	20, 21			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Florida.</i>						
Eustis .....	Inches.	Inches.		Inches.	h. m.	
Fort Barrancas .....	10.19	3.73	21			
Pensacola .....		2.75	10, 11			
		2.64	11, 12			
<i>Georgia.</i>						
Athens (1) .....	11.53	3.85	7, 8			
Do. ....		2.95	26			
Athens (2) .....	12.28					
Atlanta .....	10.16					
Blakely .....		4.80	11, 12			
Diamond .....	14.85	5.40	7, 8			
Do. ....		4.00	30, 31			
Elberton .....		2.87	27			
Forsyth .....	12.49	4.16	8			
Do. ....		2.98	11, 12			
Fort McPherson .....	10.16					
Gillsville .....	10.55					
Marietta .....	10.32	3.93	8, 9			
Milledgeville .....	12.68	4.37	8			
Do. ....		3.38	11			
Do. ....		2.60	26			
Monticello .....	13.64	3.20	5, 6			
Do. ....		4.11	8			
Do. ....		2.73	11, 12			
Point Peter .....	11.30	3.00	8, 9			
Do. ....		2.80	26, 27			
<i>Kansas.</i>						
Oberlin .....		3.75	24, 25			
<i>Kentucky.</i>						
Burnside .....		2.55	7, 8			
<i>Louisiana.</i>						
Liberty Hill .....		2.87	7			
Winnsborough .....		6.10	7, 8			
<i>Mississippi.</i>						
Agricultural College .....		3.53	5			
Booneville .....	11.62	3.00	7			
Do. ....		2.80	30			
Canton .....		5.05	7, 8			
Columbus (1) .....	12.57	5.48	5, 6			
Holly Springs (1) .....	10.44	2.05	5			
Do. ....		2.65	30			
Kosciusko .....	15.50	12.60	5, 6, 7			
Louisville .....		5.33	5, 6, 7			
Meridian .....	10.59	4.86	7, 8	2.10	1 00	8
Do. ....		3.30	25, 26			
Pontotoc .....		2.57	7			
University .....	11.10	3.43	5, 6			
Vaiden .....	11.94	6.71	7, 8			
Vicksburg .....	10.51	6.47	7, 8			
Yazoo City .....		4.06	7, 8			
<i>North Carolina.</i>						
Charlotte .....	11.13					
Hendersonville .....	11.67	5.00	7, 8			
Mount Holly .....	10.41					
Mount Pleasant .....	10.13					
Murphy .....	10.41	2.65	8			
Soapstone Mount .....	10.50					
<i>South Carolina.</i>						
Belmont .....	14.18	3.90	8			
Evergreen .....	11.60	3.08	9			
Do. ....		2.65	27			
Greenville .....	11.60	3.78	8, 9			
Simpsonville .....	10.91					
Walhalla .....	10.60					
Yorkville .....	12.47					
<i>Tennessee.</i>						
Ashwood .....	10.39	3.35	7			
Austin .....	11.43	3.19	8			
Charleston .....		2.60	7, 8			
Chattanooga .....		3.09	7, 8			
Clarksville .....		2.60	7			
Columbia .....	10.06	2.50	7, 8			
Dunlap .....		3.00	8			
Fayetteville .....		2.57	8			
Florence Station .....		3.84	7			
Franklin .....	10.03	3.73	7	1.00	1 00	6
Hohenwald .....	12.42	4.38	8			
Kingston (1) .....	10.42	3.30	7, 8			
Kingston Springs .....	10.40	2.50	7			
Lewisburgh .....		3.65	8			
Lynnville .....		3.72	8			
Memphis .....		2.85	6, 7			
Nashville .....	10.31	4.35	7, 8			
Nunnely .....	10.80	4.06	7, 8			
Parksville .....		2.82	8			
Rockwood .....	10.54	2.90	7, 8			
Rugby .....		2.50	8			
Sharp .....	11.75	5.23	7, 8			
Do. ....		2.95	30			
Waynesborough .....	10.34					
<i>Washington.</i>						
Neah Bay .....		2.55	20, 21			

Received too late to be used in general discussion for March, 1891.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Mississippi.</i>		<i>Inches.</i>	<i>Inches.</i>		<i>Inches</i>	<i>h. m.</i>
Edwards .....		2.58	7	.....		.....
Enterprise .....		3.46	25	.....		.....
Hattiesburgh .....		2.75	25	.....		.....

Received too late for publication in February, 1891.

<i>California.</i>						
Beaumont .....		2.70	23			
Campo (near) * .....	11.25	5.50	16, 17, 18			
Do .....		3.00	22			
Colegrove .....	10.14	3.17	15-16			
Do .....		4.06	21-22			
Corning .....	10.80					
Crescent City L. H. ....	17.23					
Downey .....		3.91	16			
Florence .....		3.19	16			
Glen Ellen .....	15.51					
Newhall .....		4.84	22			
Norwalk .....		2.69	16			
Ontario .....		3.20	23			
Point Año Nuevo L. H. ....	11.45					
Point Montara L. H. ....	12.53					
Pomono .....		3.85	23			
Fuente .....		3.25	23			
Ravenna .....		4.50	23			
San Gabriel .....		5.70	22			
Santa Ana .....		2.58	17			
Santa Barbara (2) .....		2.70	23			
Santa Margarita .....		3.04	23			
Santa Monica .....		4.68	16			
Do .....		2.66	22			
Santa Paula .....		3.00	23			
Seven Palms .....		4.03	23			
Spadra .....		3.20	23			
Templeton .....		2.62	23			
Tropico .....		3.33	23			
<i>Georgia.</i>						
Diamond .....	18.27	3.60	12-13			

\* 1562 Obs., 1891.

### MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during March, 1891, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Bismarck, N. Dak. § .....	0.06	21	0.11	21	0.40	21
Boston, Mass. ....	0.01	31	0.02	31	0.10	31
Buffalo, N. Y. ....						
Cincinnati, Ohio † .....	0.02	9	0.04	9	0.11	9
Chicago, Ill. § .....						
Cleveland, Ohio .....						
Denver, Colo. § .....						
Detroit, Mich. § .....						
Dodge City, Kans. ....					0.05	23
Duluth, Minn. § .....						
Eastport, Me. ....	0.05	10	0.08	10	0.30	10
Galveston, Tex. † .....						
Jupiter, Fla. ....	0.20	9	0.30	9	0.35	9
Kansas City, Mo. ....	0.20	29	0.25	29	0.45	29
Key West, Fla. ....	0.35	27	0.42	27	0.71	27
Marquette, Mich. § .....						
Memphis, Tenn. ....	0.20	7	0.30	7	0.75	7
New York City .....	0.14	9	0.18	9	0.25	9
New Orleans, La. ....	0.13	25	0.25	25	0.51	25
Norfolk, Va. ....	0.07	22	0.12	22	0.76	3
Philadelphia, Pa. ....	0.10	9	0.17	9	0.30	9, 20
Philadelphia Water Works .....	0.05	23	0.10	23	0.30	20
Portland, Oregon .....	0.03	25	0.05	25	0.15	25
Saint Louis, Mo. ....	0.10	25	0.11	25	0.18	19
Saint Paul, Minn. § .....						
San Diego, Cal. ....						
San Francisco, Cal. † .....						
Savannah, Ga. ....	0.15	21	0.15	21	0.25	17, 27
Washington City .....	0.03	22	0.05	22	0.25	31
Wilmington, N. C. ....	0.20	27	0.25	8	0.50	31

\* Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour.  
§ No record on account of snow.

### SNOW (in inches and tenths).

Chart V shows the depth of snowfall reported for the month. The heaviest monthly snowfall was 64.0, at Cumbres, Colo.; 54.5 was reported at Blue Knob, Pa.; 51.0 at Summit, Cal.;

46.5 at Alton, Kans., and 45.4 at Marquette, Mich. The monthly snowfall exceeded 20.0 in central New York, at elevated stations in Pa., and thence southward to north-central Virginia, from the north part of the upper lake region southward over east Iowa, in north Kansas and south Nebraska, at elevated stations in Colorado, south Wyoming, and northeast Utah, and at stations on the middle-eastern and northeast slopes of the Rocky Mountains. The monthly snowfall exceeded 10.0 in the interior of New England and the middle Atlantic states, and north of a line traced from west-central Pennsylvania irregularly south of west to north New Mexico, and thence west of north to north Idaho (except in northeast Montana and west North Dakota), in east-central and northeast Nevada, and in the mountains of northeast California. Compared with the preceding month snow was reported about 3° farther south in Texas, while the western limit remained about the same.

The following is a record of the heaviest snowfall reported for March in the several states and territories from 1882 to 1890, inclusive, with the year of occurrence: in 1890, Ala., trace, at Valley Head; Ariz., 19.0, at Prescott; Ark., 5.3, at Winslow; Colo., 64.5, at Breckenridge; Conn., 30.0, at Falls Village; Ga., 2.7, at Diamond; Ill., 23.0, at Lake Forest; Ind., 21.0, at Evansville; Me., 45.0, at Cornish; Mass., 40.0, at Groton; Mich., 52.5, at Bear Lake; Mo., 21.0, at Saint Louis; Mont., 18.1, at Fort Maginnis; Nebr., 19.2, at Valentine; Nev., 37.0, at Ruby Hill; N. H., 42.0, at Nashua; N. J., 25.5, at Oceanic; N. Mex., 14.0, at Chama; Ohio, 21.9, at Jefferson; Oregon, 23.0, at Siskiyou; Pa., 49.0, at Blue Knob; R. I., 26.0, at Woonsocket; Wash., 6.0, at Waterville; Wyo., 28.8, at Camp Sheridan. In 1889, Indian Territory, 0.4, at Fort Sill; Tex., 3.9, at Fort Elliott. In 1887, Ky., 15.6, at Harper's Ferry; Md., 15.0, at Fallston; Vt., 53.0, at Strafford; W. Va., 25.5, at Middlebrook. In 1886, Iowa, 28.0, at Clinton; Kans., 15.4, at Concordia; Wis., 27.1, at Madison. In 1885, Dak., 32.5, at Deadwood; S. C., 11.0, at Paolet; Tenn., 12.0, at Milan. In 1884, Del., 12.0, at Saint George's; N. Y., 67.2, at Dannemora; Utah, 32.0, at Salt Lake City. In 1883, District of Columbia, 8.0, at Washington City; N. C., 13.0, at Ore Knob; Va., 15.5, at Wytheville. In 1882, Cal., 251, at Cisco; Idaho, 34.5, at Eagle Rock; Minn., 27.2, at Duluth.

The first snow of the season was reported at Palestine, Tex., 1st, at Willcox, Ariz., 4th, and Augusta, Ga., 7th.

On the 2d a heavy snow storm prevailed over south Montana and South Dakota. At Grand Haven, Mich., light snow was reported from a cloudless sky from 9.30 to 11.30 a. m. On the 4th a heavy snow storm blocked railroad trains in South Dakota and southwest Minnesota. At Alpena, Mich., the heaviest storm of the season occurred, the snow drifting 4 to 6 feet deep. At New London, Conn., a heavy snow storm, with high wind, delayed Sound boats 12 to 15 hours. At Boston, Mass., the snow storm continued from the morning of the 3d to the early morning of the 5th, during which time 13.8 inches fell, and street and railroad traffic was interrupted. At Manchester, N. H., snow began the morning of the 3d and continued through the 4th, causing considerable interruption to traffic in the surrounding country. On the 5th, at Minneapolis, Minn., light snow was reported from a cloudless sky from 8.30 to 10.30 p. m. On the 6th the heaviest snow of the season fell at Milwaukee, Wis., 6.0 fell from 7.40 a. m. to 6.30 p. m., and the greater part of this amount fell in 6 hours. On the 7th a heavy fall of snow occurred from west Iowa to east Colorado, and by the 8th the storm had extended eastward to Illinois. On the 8th over 8.0 fell at Cedar Rapids and Dubuque, Iowa. From the 9th to 12th the Denver and Rio Grande Railroad was blocked by snow between Tres Piedras, N. Mex., and Antonito, Colo., and a heavy snow storm was reported in San Juan Co., N. Mex. On the 10th railroad travel in North Dakota was impeded by heavy snow. A snow and sleet storm at Memphis, Tenn., on the 12-13th seriously interfered with electric railroad travel and electric lights. On the 13th one of the heaviest snow storms of the season

occurred at Port Huron, Mich.; snowfall about 6.5. On the 13-14th a heavy snow storm prevailed at Cleveland, Ohio. On the 19th snow-flakes the size of a silver dollar fell from 1 to 2 p. m. at Columbia, Mo. On the 21st 14.0 was reported at Meshoppen, Pa.; sheds were broken down and roofs caved in under the weight of snow. From the 23d to 25th a heavy snow storm prevailed over Kansas; 10.0 to 20.0 fell, and the snow drifted badly in places, blockading railroads and causing loss of live stock. On the 27th heavy snow fell in York Co., Pa., the estimated depth being 14.0. On the 27th and 28th a heavy snow storm prevailed over south Pennsylvania, Maryland, District of Columbia, and north Virginia, the depth varying from 10.0 to 20.0. This storm was reported the heaviest of the season, and in Frederick Co., Va., it was reported the heaviest snow storm in many years. On the 29th and 30th a heavy snow storm prevailed in South Dakota and Nebraska. This snow storm was reported the heaviest in years. At North Platte, Nebr., 12.0 fell on the 29th.

Snowfall of 10.0, or more, was reported as follows, and in states and territories where the maximum depth was less than that amount, the station reporting the greatest is given: *Alabama*.—Valley Head, trace. *Arizona*.—Holbrook, 7. *Arkansas*.—Mount Nebo, 7.5. *California*.—Summit, 51; Truckee, 28; Cisco, 25; Emigrant Gap, 20; Boca, 18. *Colorado*.—Cumbres, 64; Smoky Hill Mine, 54; Leadville, 46.5; Lamar, 46.1; Stunner, 44.2; Breckenridge, 41.5; Denver, 41.4; Climax, 39.5; Stamford, 38; Dillon, 35.2; Red Cliff, 35.1; Saint Cloud, 32; Box Elder and Elkhorn, 30.5; Rifle Falls, 30; Burlington and Magnolia, 29; Husted, 26.5; Fort Logan, 26; Idaho Springs, 25.8; Las Animas, 24; T. S. Ranch, 21.7; Cañon City, Rico, and Watervale, 21; Meeker, 20.5; Greenhorn, and Yuma, 20.2; Akron, 20; San Luis, 19.8; Le Roy and Wray, 19; Abbott, 18; Apishapa, 17.5; Alma and Amherst, 17; Livermore, 16.6; Julesburg, 16.5; Sheridan Lake, 16; Minneapolis, 15; Alford, 14.9; Byers, 14.8; Villa Grove, 14.2; Bennet, 14; Fort Lewis, 13.8; Longmont, 13.2; Monte Vista (1), Rocky Ford, and Vilas, 13; Castle Rock, 12.9; Crook, 12.8; Westcliffe, 12.5; Beaver Creek and Springfield, 12.2; Brandon, 12; Pueblo, 11.9; Brush, 10.7; Agate and Lay, 10.5; Kit Carson, 10.1; Cheyenne Falls and Deer Trail, 10. *Connecticut*.—North Grosvenor Dale, 12. *Delaware*.—Dover, 4.5. *District of Columbia*.—Washington City, 17. *Idaho*.—Henry's Lake, 14; Mullan, 11. *Illinois*.—Rock Island Arsenal, 20.1; Warsaw and Winnebago, 17; Lanark and Rockford, 15; East Peoria, 12.4; Belvidere, 11.5; Lacon, 10.5. *Indiana*.—Angola, 15.8; Rushville, 11.5; Princeton, 11; Logansport, 10.5; Connersville and Farmland, 10. *Indian Territory*.—Wynne Wood, 3.7. *Iowa*.—Fairfield, 32.5; Carroll and Hampton, 29; Washington, 26.5; Indianola, 25.5; Dubuque and Belle Plaine, 25; Muscatine, 23.8; Webster City, 23.2; Cedar Rapids, 22.5; Vinton and West Bend, 22; Dallas Centre and Tipton, 21; Monticello, 20.5; Greenfield, 19.9; Independence, 19.5; Ames and Iowa City, 19; Fayette and Marshalltown, 18.8; Amana and Clinton, 18; Des Moines, 17.5; Oskaloosa, 17.3; Clarinda, 17; Cedar Falls, 16.3; Eagle Grove, 16; Hopeville and Manson, 15.5; Stilson, 15; Williams, 14.1; Logan, 14; Charles City, 13.6; Humboldt, 13.2; Keokuk, 13.1; Fort Madison, 13; Cresco, 12; Larrabee, 11.9; Glenwood, 10.8; Alta (1 and 2), 10.5; Davenport, 10. *Kansas*.—Alton, 46.5; Collyer and McAllaster, 33.5; Downs, 26.5; Wakefield, 25.8; Concordia, 25; Springvale, 22; Buffalo Park and Seneca, 21.5; Abilene, 20.6; Fremont, 20.2; Dodge City, 20; Grainfield, 19.2; Wa Keeny, 19.1; Sharon Springs and Wallace (2), 19; Allison, 18.6; Macksville, 18.5; Monument, 18.4; Cawker City and La Crosse, 18; Ellis, 17.9; Shields, 17.6; Gove City, Hoxie, Lakin, and Salina, 17; Pleasant Dale, 16.5; Coldwater, Havensville, and Manhattan (3), 16; Grinnell, 15.5; Leoti and Spearville, 15; Leavenworth, 14.9; Burr Oak, 14.5; Manhattan (1) and Quinter, 14; Ogallah, 12.8; Eureka Ranch and Scott City, 12.5; Minneapolis, 12.2; Manhattan (2), Mankato, and Weskan, 12; Cunningham, 11.3; Globe, 11.2; Hutchinson, 11.1; Horton and Tribune, 11; Kansas City, 10.7; Page City,

10. *Kentucky*.—Pellville, 7.8. *Maine*.—Calais, 21; Farmington, 15.2; Fairfield, 15; Orono, 12; Eastport, 11.3; Lewiston, 11; Kent's Hill, 10. *Maryland*.—Mount Saint Mary's, 35; Cumberland (1), 33; Woodstock, 25.9; Gaithersburgh, 24; Cumberland (2), 21; Baltimore, 20.5; McDonogh, 18.9. *Massachusetts*.—Mystic Lake, 23; Wakefield, 22; Concord and Salem (2), 21; Andover, Fitchburgh (1), Groton (1), and Newburyport (1), 18; Westborough, 17.5; Kendall Green, 17; Boston, 16.2; Lawrence and Winchester, 16; Blue Hill (summit), 15.3; North Billerica, 15; Chestnut Hill and Milton, 14.5; Fitchburgh (2), Leominster, and Mansfield, 14; Royalston, 13.4; Robert's Dam and Randolph, 13; Fort Warren, 12.2; Amherst Experimental Station (1), Gilbertville, Ludlow (1 and 2), South Hingham, and Springfield Armory, 12; Dudley, 10. *Michigan*.—Marquette, 45.4; Roscommon, 35.7; Grayling, 34.5; Northport, 32.5; Atlantic, 32; Caldwell, 30; Ivan, 26.5; Cheboygan, 25.5; Alpena, 24.6; Bear Lake, 24.5; Crystal Falls, 22.7; Charlevoix and Saint Ignace, 22.5; Calumet, 22.1; Fort Mackinac, 21.6; Rockland, 21.5; Harbor Springs, 21; Manistee, 20.1; Noble, 18.5; White Pigeon, 17.3; Buchanan and Colon, 17; Alma and Bellaire, 16.7; Pontiac, 16.5; Fort Brady, 15.6; Fitchburgh, 15.2; Gaylord, 15; North Aurelius and West Branch, 14.5; Hudson, 14.4; Ball Mountain, Berrien Springs (2), Grape, and Thornville, 14; Lansing, 13.9; North Marshall, 13.7; Adrian and Madison, 13.6; Birch Run, 13.4; Washington, 13.2; Port Huron and Chelsea, 13.1; Cassopolis, Hillman, Howell, and Rawsonville, 13; Stanton, 12.6; May, 12.5; Jeddo, 12.2; Williamstown, 12; Vandalia, 11.9; Berlin, Eden, and Highland Station, 11.5; Marshall, Mottville, and Olivet, 11.2; Evart, Fairview, and Otsego, 11; Bell Branch, 10.7; Sault de Ste. Marie, 10.1; Bronson, Hayes, and Ypsilanti, 10. *Minnesota*.—Duluth, 31; Grand Meadow, 17; Saint Charles, 16.5; Sheldon, 16; Red Wing, 15.6; Fari-bault, 14.7; Moorhead, 14.1; Farmington and Mankato, 13.5; Pokegama Falls, 13.3; Minneapolis, 12.5; Northfield, 12.2; Kinbrae, 12; Crookston, 11.5; Rolling Green, 11; Alma City, 10.3. *Mississippi*.—University, Pontotoc, and Water Valley, trace. *Missouri*.—Oregon (1), 22.1; Pickering, 18; Excelsior Springs, 14.2; Langdon, 14.1; Darksville and Glasgow, 12; Kansas City and Liberty, 11.8; Carrollton, 11.6; Platte River, 10.8; Grand Pass and Princeton, 10. *Montana*.—Helena, 22; Fort Missoula and Virginia City, 19; Martinsdale, 15.2; Choteau, 10.

*Nebraska*.—Grant, 31.5; Tecumseh, 30.2; Hay Springs and Weeping Water, 25.5; Valentine, 24.8; North Platte, 23.8; Fairbury, 23; Auburn (1) and Imperial, 20; Fort Robinson, 19.5; O'Neill, 19; Lincoln, 18.8; Ansley, 18.7; Crete, 18.4; Ravenna, 17.8; Hebron, 17.5; Lexington, 17; Ashland, 16; Culbertson and Fort Niobrara, 15; North Loup, 14.5; Alliance, Bassett, Minden, Omaha, and Sargent, 14; David City and Ericson, 12; Gering, 12.2; Syracuse, 12; Fort Sidney, 11.7; Fairfield and Genoa, 11; Harvard, 10.8. *Nevada*.—Eureka, 18.7; Crane's Ranch, 18; Austin, 17.8; Virginia City, 15.5; Palmetto, 14.3; Palisade, Carlin, and Elko, 13; Lewer's Ranch, 11.4; Fenelon, 11; Toano, 10. *New Hampshire*.—North Conway, 22; Berlin Mills, 21; Newton, 18; West Milan, 17; Nashua, 15; Antrim and East Canterbury, 13; Concord, Hanover (1), and Plymouth, 12; Littleton, Stratford, and Walpole, 10. *New Jersey*.—Bridgeton, 10. *New Mexico*.—Fort Wingate, 17; Cuba, 15.5; Monero, 15.3; Gallinas Spring, 15; Albert, 10. *New York*.—Le Roy, 36; Constableville, 32; Turin, 26.6; Lowville, 22; Utica, 20.5; Apulia, 20; Malone, 19.5; Sherman, 17; Number Four, 15.8; Brookfield, 15.5; Canton, 14.6; Humphrey, 14.5; Plattsburgh Barracks, 14.3; Newark Valley and Potsdam, 14; Oswego and Baldwinsville, 13.5; Ogdensburgh (1), 12.5; Lyon Mountain (2) and Rochester, 12.2; Alabama, Middleburgh, and Port Jervis, 12; South Canisteo, 11.8; Keene Valley, 11.2; Rondout, 11; Binghamton, 10.5; Hess Road Station, 10.3; Adams Centre, Cooperstown, and Galway, 10. *North Carolina*.—Murphy, 3. *North Dakota*.—Steele, 15.2; Bismarck, 11.4; Napoleon, 11.1; Fort Pembina, 10.9; Wahpeton, 10. *Ohio*.—Wapakoneta, 20.6; Montpelier,



20.2; Findlay, 18.2; Wauseon, 17.4; Caledonia, 16.8; Celina, Sidney, and Orangeville, 16.5; Napoleon, 16.2; North Lewisburgh, 14; Kenton, 13.5; Wheeler, 13.2; West Milton, 12.9; Leipsic, 12.8; Garrettsville, 12.5; Bellevue and Bement, 11.5; Greenville, 11.3; Tiffin, 10.8; Hiram, 10.6; Columbus, Toledo, and Upper Sandusky, 10. *Oklahoma Territory*.—Buffalo, 18. *Oregon*.—Joseph, 20.5; Lone Rock, 14.5; Heppner, 14; Happy Valley, 11.5. *Pennsylvania*.—Blue Knob, 54.5; Charlesville, 39; Carlisle, 33.2; Grampian Hills, 31; Lewisburgh, 27.6; Coatesville, 25.9; Selin's Grove, 25.2; York and McConnellsburgh, 24; Somerset, 23; Harrisburgh and Smethport, 22; Lock Haven, 21.5; Lancaster, 21; Meshoppen, 20.5; Nisbet, 20; Kennett Square, 19.5; Aqueduct and West Chester, 18.5; Hollidaysburgh, 18.2; Greenville, 18; Kilmer, 17.2; Johnstown, 17; Emporium and Pleasant Mount, 16.5; Lebanon, 15.7; State College, 15.1; Rimersburgh and South Eaton, 15; Salem Corners, 14.8; Eagle's Mere, 14.2; Erie, 14; Westtown, 13.5; Wysox, 13; Le Roy, 12.2; Blooming Grove, 12; Dyberry and Girardville, 11; Honesdale, 10.5; Troy and Wilkes Barre, 10.

*Rhode Island*.—Lonsdale and Pawtucket, 9.0. *South Dakota*.—Oelrichs, 40; Cross, 20.2; Webster, 18.1; Elkton, 16.8; Huron, 15.5; Fort Randall, 13.4; Spearfish, 12.5; Rapid City and Flandreau, 12; Wolsey, 10.5; Clark, Howard, Kimball, Scranton, and Sioux Falls, 10. *Tennessee*.—Union City, 7. *Texas*.—Mountain Spring, 4. *Utah*.—Park City, 33; Parowan, 17; Salt Lake City, 13.1; Nephi, 10.5. *Vermont*.—Strafford, 21.5; Northfield, 18.8; East Berkshire, 17; Lunenburg, 16.5; Chelsea, 16; Burlington, 14; Vernon, 13; Brattleborough (1), 12.8; Jacksonville, 12. *Virginia*.—Woodstock, 22; Staunton, 21; Dale Enterprise, 19.8; Bolar, 19; Lexington, 17; Salem, 13.6; Yancey's Mills, 12.5; Petersburg and Stanardsville, 11.5; Bedford City and Christiansburgh, 11. *Washington*.—Chehalis, Seattle, and Walla Walla, 1.1. *West Virginia*.—Mont Alto, 37; Harper's Ferry, 20.1. *Wisconsin*.—Embarrass, 31; Chippewa Falls, 26.5; Bayfield and De Pere, 24.5; Koenig and Madison, 24; Lancaster, 23; Menomonie, 22.3; Oconto, 22; Columbus, 21.8; Hillsborough, 21.5; Hayward, 20.2; Butternut and Ithaca, 20; Peshtigo, 19.8; Medford (2), 19.4; Rhinelander, 18.7; La Crosse, 18.5; Green Bay, 18.1; Hammond and Phillips, 18; Beaver Dam and Greenwood, 17; Milwaukee, 16.6; Meadow Valley, 16.4; Cadiz and Whitehall, 16.2; Elroy, 15.4; Manitowoc, 15.2; Appleton (1) and Glasgow, 15; Neillsville, 14; Plover and Hudson, 13.8; Eau Claire, 13.5; Medford (1), 12.8; Oshkosh, 12.7; Prairie du Chien, 12.5; Janesville, 10.5; Fond du Lac, 10. *Wyoming*.—Fort McKinney, 25.2; Camp Pilot Butte, 21.3; Saratoga, 21; Camp Sheridan, 18.8; Wheatland, 16; Cheyenne, 15.3; Laramie, 15.

#### DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart IV shows the depth of snow reported on the ground

at the close of the month. At Cumbres, Colo., 108.5 was reported; more than 20.0 was reported at mountain stations in south-central Pennsylvania, northeast West Virginia, upper Michigan, Colorado, and in northeast-lower Idaho, and a depth of more than 10.0 was noted at stations in New Hampshire, Maine, Michigan, Wisconsin, Nebraska, and Idaho. Trace of snow was reported on the ground from New England southwest, inside the coast line, to western Virginia, and north of a line traced from east Michigan southwestward to extreme north-central New Mexico, thence to south Utah, and thence west of north over the east part of the northern plateau.

#### HAIL.

Description of the more severe hail storms of the month is given under "Local Storms." Hail was reported as follows: 1st, Cal. 2d, Ind., N. C., Utah. 3d, Ala., Ill., Ohio, Tenn., Utah. 4th, Utah. 5th, Ala., Cal. 6th, Ala., Ariz., Md., N. C., S. C., Tenn. 7th, Ariz., La., Miss., Mo., Okla. T., Tenn., Tex. 8th, Miss., Tex., Wis. 9th, Mich., Ohio, Tex. 10th, Utah. 11th, Ill., Mo. 12th, Tex. 13th, N. Y., Oregon, Tenn. 15th, Nev., Tex. 16th, Cal. 17th, Kans., Wis. 18th, Ark., Cal. 19th, Ill., Mo. 20th, Colo., Ind., N. Y., N. C., Tex. 21st, Ala., Fla., Ga., Ky., S. C., Tenn., Wis. 22d, Cal., Mass., N. C., Oregon, Utah. 23d, Ariz., Tex. 24th, Ariz., Tex. 25th, Miss., Tex. 26th, Cal., Ga., Ill., Ohio. 27th, Cal., Ky., Ohio, Oregon, Wash. 28th, Colo., Kans., Md., N. J., Oregon, Va. 29th, Iowa, Kans., Mo., Nebr. 30th, Ill., Iowa, Mich., Miss., Tex., Wis. 31st, Ky., Ohio, Utah, Wis.

#### SLEET.

Description of the more severe sleet storms of the month is given under "Local Storms." Sleet was reported as follows: 1st, S. C. 2d, Ill., Ind., Kans., Va. 3d, Ill., Kans., Mo., N. C., Ohio, Va., W. Va. 4th, Ind., Kans., N. J., N. Y., N. C., R. I., Utah, W. Va. 5th, Ala., Ariz., Ark., Ga., Ill., Ind., Miss., Mo., N. Mex., N. C., Ohio, S. C., Tenn., Va. 6th, Ariz., Ill., Ind., Ky., Mo., N. J., N. C., Ohio, Tenn., Va. 7th, Ariz., Ill., Kans., Mo., Okla. T., Ohio, Wis. 8th, Ark., Ill., Iowa, La., Mich., Mo., N. J., Pa., Tex., Wis. 9th, Conn., Mont., Ohio, Pa., Tenn., Vt. 10th, Conn., Mo., Vt. 11th, Conn., Ill., Kans., Mo., N. Mex., Tenn. 12th, Ark., Ill., Ind., Ky., La., Ohio, Tenn., Tex. 13th, Ark., Miss., N. Y., Ohio, Tenn., Tex. 16th, N. Mex., Ohio, S. Dak. 17th, Kans., Nebr., Wis. 18th, Ill., Iowa, Kans., Mo., Nev., Ohio, 19th, Ill., Iowa, Ky., Mo., N. Mex., N. Y., Ohio. 20th, Colo., Iowa, Mich., N. J., N. Y., Ohio, Pa., Tenn., W. Va. 21st, Mass., Mo., N. H., Pa. 22d, Ill., Pa., Va. 23d, Colo., Kans., Tex., Wis. 24th, Kans., Mich. 25th, Mo., Tex. 26th, Colo., Ill., Iowa, Mich., N. C., Ohio, W. Va., Wis. 27th, Mich., Nev., Ohio, Va. 28th, Colo., Mich., Nebr., N. C., Va., Wash. 29th, Colo., Iowa, Minn., N. Dak. 30th, Iowa, Mich., Minn., Wis. 31st, Mich., Minn., N. Y., Pa., Wis.

#### WINDS.

The prevailing winds during March, 1891, are shown on Chart II by arrows flying with the wind. In New England, the south Atlantic states, the Ohio Valley and Tennessee, the upper Mississippi Valley, and on the middle-eastern slope of the Rocky Mountains the winds were generally from northwest to northeast; in the middle Atlantic states, northeast; over the Florida Peninsula, south to west; in the west Gulf states, northeast to southeast; in the Lake region, northeast to east; in the extreme northwest, northwest to north; in the Missouri Valley, northwest; on the northeast slope of the Rocky Mountains and along the north Pacific coast, southeast to southwest; on the southeast slope of the Rocky Mountains, south to southwest; over the plateau region and on the middle Pacific coast, southwest to northwest; on the south Pacific coast, west to northwest; and in the east Gulf states and the Rio Grande Valley, variable.

#### HIGH WINDS.

(In miles per hour.)

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 3d, 59, e., at Block Island, R. I. 4th, 62, e., at Block Island, R. I.; 54, sw., at Buffalo, N. Y.; 50, se., at Nantucket, Mass.; 62, nw., at Wood's Holl, Mass. 8th, 50, nw., at Lexington, Ky. 9th, 50, w., at Fort Assiniboine, Mont. 10th, 52, s., at Chicago, Ill. 13th, 60, sw., at Northfield, Vt.; 60, sw., at Buffalo, N. Y.; 14th, 50, nw., at Buffalo, N. Y.; 50, w., at Wood's Holl, Mass. 15th, 51, s., at Port Huron, Mich.; 56, sw., at Chicago, Ill. 16th, 50, nw., at Wood's Holl, Mass. 18th, 54, nw., at Keeler, Cal. 19th, 50, sw., at Fort Canby, Wash. 20th, 57, ne., at Block Island, R. I.; 56, se., at Fort Canby, Wash. 21st, 70, ne., at Block Island, R. I.; 50, nw., at Fort McKinney, Wyo. 25th, 50, ne., at Chicago, Ill.